AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-3 (canceled)

4. (previously presented) An extracorporeal circuit claimed in claim 29, wherein the valve member is arranged to adopt an idle position in which all four openings are interconnected.

5-6. (canceled)

7. (currently amended) An extracorporeal circuit claimed in claim ~~6~~ 29, wherein the valve member is pivotable from a normal condition of blood flow position, through an idle position and to a reverse condition of blood flow position.

8. (currently amended) An extracorporeal circuit claimed in claim ~~6~~ 29, wherein the valve member is pivotable through 90°.

9. (previously presented) An extracorporeal circuit claimed in claim 29, wherein the openings are disposed on the valve housing diametrically opposite to each other.

10. (previously presented) An extracorporeal circuit claimed in claim 9, wherein the valve chamber is cylindrical and the openings are spaced 90° relative to each other around the chamber.

11. (previously presented) An extracorporeal circuit claimed in claim 29, wherein the openings are each provided with a respective connector.

12. (currently amended) An extracorporeal circuit claimed in claim 29, ~~wherein the valve member forms a~~ said partition dividing the valve chamber in two portions.

13. (previously presented) An extracorporeal circuit claimed in claim 12, wherein each of said portions is semi-circular.

14. (currently amended) An extracorporeal circuit claimed in claim 29, wherein the valve member includes ~~a valve partition that extends into the valve chamber and~~ a wing with which the valve member can be manually moved.

15. (currently amended) An extracorporeal circuit claimed in claim ~~14~~ 29, wherein the valve member includes a shoulder, which limits the pivoting movement of the valve member in the chamber.

16. (previously presented) An extracorporeal circuit claimed in claim 15, wherein the shoulder cooperates with a groove on the periphery of the valve chamber.

17. (previously presented) An extracorporeal circuit claimed in claim 16, wherein the groove has recesses defining normal and reverse positions.

18. (currently amended) An extracorporeal circuit claimed in claim 17, wherein the groove also has a recess defining ~~the~~ an idle position.

19. (currently amended) An extracorporeal circuit claimed in claim 11, wherein a first and a second of said connectors extend diametrically opposite from the valve housing and a third and a fourth of said connectors are symmetrically inclined by less ~~then~~ than 90 degrees with respect to a direction of the first connector.

20-21. (canceled)

22. (previously presented) An extracorporeal circuit according to claim 29 comprising a third line for connecting the circuit outlet connector to the inlet of the dialyzer blood compartment, and a fourth line for connecting the circuit inlet connector to the outlet of the dialyzer blood compartment.

23-28 (canceled)

29. (currently amended) An extracorporeal circuit for use with blood flow from a blood access comprising:

a switch valve comprising:

a valve housing ~~having~~ defining a chamber,

four openings communicating with the chamber wherein each opening has a peripheral width; and

a connector for each of said openings, said connectors including:

a first blood inlet connector,

a second blood outlet connector,

a circuit inlet connector, and

a circuit outlet connector;

a dialyzer having a blood compartment and a dialysis fluid compartment separated by a semi-permeable membrane, wherein the blood compartment comprises:

an inlet connected to the circuit outlet connector; and

an outlet connected to the circuit inlet connector;

a first line connected to the first blood inlet connector;

an arterial needle connected to the first line and for connection to the blood access;

a second line connected to the second blood outlet connector;

a venous needle connected to the second line and for connection to the blood access;

the dialysis fluid compartment comprises:

an inlet for connection to a source of dialysis fluid, and

an outlet;

a dialysate line connected to the outlet of the dialysate compartment;

the switch valve comprising

a ~~movable~~ pivotable valve member located in the valve chamber and ~~movable~~ pivotable therein to change the direction of blood flow among the openings from a normal condition to a reversed condition, said pivotable valve member having a blood-impervious partition which is rotatable with said valve member, said partition in said normal condition extending across the entire inside diameter of said valve chamber and thereby sealing a pathway between said first blood inlet connector and said circuit outlet connector, said ~~valve member~~ partition being constructed ~~without dead end portions and further being constructed~~ of a width that is less than the peripheral width of each opening;

a monitor connected to the dialysate line for measuring, in the normal condition of blood flow, a first variable in the dialysate, and for measuring, in the reversed condition of blood flow, a second variable in the dialysate;

a calculating means for calculating a blood flow rate in the blood access from the first

and second variables.

30. (canceled)

31. (previously presented) The extracorporeal circuit of claim 29 wherein the first variable is proportional to a concentration Cd norm of a substance in the dialysis fluid from the dialyzer outlet where the blood flow is in the normal condition, and the second variable is proportional to the concentration Cd rev of said substance in the dialysis fluid where the blood flow is in the reversed condition.

32. (previously presented) The extracorporeal circuit of claim 31 wherein the calculating means calculates the blood flow rate in the blood access by the formula:
Cd norm/Cd rev=1+K/Qa in which Cd norm and Cd rev are values proportional to the concentrations of said substance in the dialysate in the normal and reversed conditions respectively, K is the clearance of the dialyzer and Qa is the blood access flow rate.

33. (previously presented) The extracorporeal circuit of claim 32 wherein the blood access is an arteriovenous shunt or fistula, and the dialyzer clearance K comprises the effective dialyzer clearance Keff wherein Keff comprises:
Keff=Qd*Cd/Cs where Qd is the flow rate of dialysate, Cd is the concentration of said substance in said dialysate and Cs is the concentration of said substance in systemic venous blood from the blood access.

34. (previously presented) The extracorporea1 circuit of claim 31 wherein said substance is selected from the group consisting of: urea, creatinine, vitamin B12, beta-two-microglobuline and glucose.

35. (previously presented) The extracorporeal circuit of claim 31 wherein said substance is an ion selected from the group consisting of: Na<+>, Cl<->, K<+>, Mg<++>, Ca<++>, HCO3<->, acetate ion, or any combination thereof as measured by changes in conductivity between the outlet and the inlet of the dialyzer.

36. (new) The extracorporeal circuit of claim 29, said partition in said normal condition also sealing a pathway between said second blood outlet connector and said circuit inlet connector.